

Spontaneous liver haematoma as a result of thrombolytic therapy

Jeremy Lynch and Simon Etkind

*Department of General Surgery, Royal Sussex County Hospital,
Eastern Road, Brighton, BN2 5BE, UK*

*Corresponding address: Jeremy Lynch, Department of General Surgery, Royal Sussex County
Hospital, Eastern Road, Brighton, BN2 5BE, UK.*

Email: jeremy.lynch@gmail.com

Date accepted for publication 11 April 2010

Abstract

Spontaneous liver haemorrhage due to thrombolysis is an extremely rare and life-threatening condition. This is the only report of spontaneous liver haemorrhage following thrombolysis in the literature that has been managed non-operatively, and proves such an approach is possible. The clinical findings and management of this case are discussed in relation to the relevant literature.

Keywords

Plasminogen activators; thrombolytic therapy; fibrinolytic agents; drug-induced liver injury.

Introduction

Haemorrhage is the most serious complication of thrombolysis. It is most commonly related to vascular puncture^[1], and other sites include intracranial^[1], pericardial, splenic, gastrointestinal, and retroperitoneal^[2].

Liver haemorrhage is usually the result of trauma or puncture (during liver biopsy). Spontaneous liver haemorrhage is associated with abnormalities such as liver cancer (86%), cirrhosis, angioma, adenoma, or liver metastases^[3]. None of these was present in our patient. It is very rare to have spontaneous bleeding in the liver after thrombolysis, although it has been observed with anticoagulants such as heparin and warfarin^[4]. We present the first case of spontaneous liver haemorrhage after thrombolysis that has been successfully managed conservatively.

Case presentation

A 47-year-old man presented following an episode of severe chest pain radiating to the left arm and dyspnoea. His history of note included hypercholesterolaemia and an anterior ST-elevation myocardial infarction 2 months previously. He described no trauma before admission and typically drank 1–2 pints of moderate-strength lager per day. His current medications included aspirin 75 mg once daily (OD), clopidogrel 75 mg OD, bisoprolol 2.5 mg OD, ramipril 2.5 mg OD, simvastatin 40 mg OD. Systemic examination was unremarkable and his vital signs were stable.

This paper is available online at <http://www.grandrounds-e-med.com>. In the event of a change in the URL address, please use the DOI provided to locate the paper.

His electrocardiograph revealed ST elevation in the inferior leads and a troponin T test was measured at 10.80 µg/L. Other blood results were normal (haemoglobin 16.4 g/dL, white blood cell count 11.0×10^9 /L, bilirubin 10 mg/dL, alkaline phosphatase 108 IU/L, alanine aminotransferase 48 IU/L, urea 4.3 mmol/L, creatinine 104 µmol/L, international normalised ratio 1.1, activated partial prothrombin time ratio 0.9) and a chest radiograph was unremarkable. A diagnosis of inferior ST-elevation myocardial infarction was made. The patient had no contraindications to thrombolytic therapy and was given 50 mg of tenecteplase. In addition, 300 mg of aspirin and 300 mg of clopidogrel was given and a heparin infusion of 1500 units/h was started. Because of persisting chest pain and ST elevation, percutaneous coronary intervention (PCI) was performed 5 h after thrombolysis and revealed a patent left anterior descending artery stent and proximal occlusion in the dominant right coronary artery. A stent was inserted in the right coronary artery. No other procedures were performed (e.g. femoral pacing catheter) that could have caused trauma endovascularly to the liver. A total of 5000 units of intra-arterial heparin, four boluses of 0.3 mg intra-coronary isosorbide mononitrate, and two boluses of 17 mg intra-coronary eptifibatide were delivered.

Three hours after PCI the patient started to complain of abdominal and shoulder tip pain. He had one episode of coffee-ground vomiting. On examination, he was pale and clammy, his blood pressure was 105/65 mmHg and his pulse was 120 bpm. The abdomen was tender in the right upper quadrant and left flank. There was no bleeding or haematoma of the femoral puncture site. The patient was successfully resuscitated with gelofusin, intravenous omeprazole was given, and the heparin infusion was stopped. An abdominal computed tomography (CT) scan revealed a large subcapsular liver haematoma of 44 mm in axial diameter (Fig. 1), free fluid in the right and left subphrenic spaces tracking down both paracolic gutters into the pelvis. The patient's haemoglobin levels fell from 16.4 g/dL to 10.7 g/dL. Arterial blood sampling revealed a pH of 7.31, P_{CO_2} of 4.1 kPa, P_{O_2} of 23 kPa, HCO_3^- of 15.6 mEq/L, base excess of -10.7 mEq/L, lactate of 6.7 mmol/L. Two units of erythrocyte suspension were given to the patient.

The patient responded well to resuscitation. A repeat CT abdomen 24 h later showed that the liver haematoma appeared smaller, and the decision was made not to operate. The patient developed acute kidney injury, thought to be due to hypovolaemia and radioiodine use, and was treated with intravenous fluid. He additionally acquired left basal atelectasis and continuous positive airway pressure ventilation was delivered in the high-dependency unit. A third CT 3 days after admission revealed the haematoma was smaller than it was initially, now at 38 mm. The patient remained haemodynamically stable. A magnetic resonance imaging scan was performed at 5 days to search for any abnormalities that would predispose the patient to bleeding (Fig. 2). None were identified and the scan confirmed regression of the haematoma to 33 mm with no evidence of active bleeding. The patient continued to improve and was discharged at 17 days. He was re-admitted with right upper quadrant pain 1 month after discharge. The haematoma had expanded to 143 mm in largest axial diameter, but there was no evidence of active arterial bleeding (Fig. 3). A full blood count revealed a haemoglobin of 13.6 g/dL and other blood results were within normal range. The patient was again managed conservatively and was discharged home.

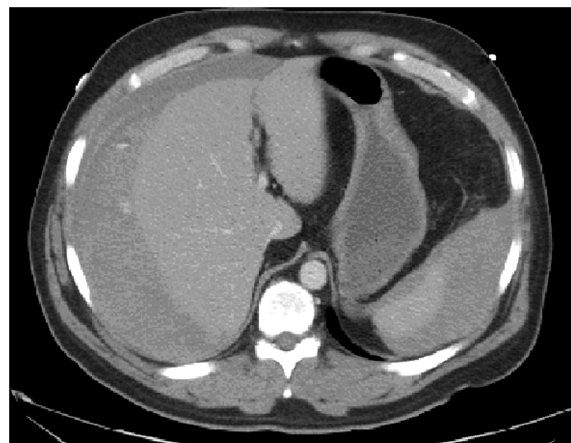


Fig. 1. Contrast-enhanced abdominal CT showing liver haematoma at 7 h after thrombolysis.

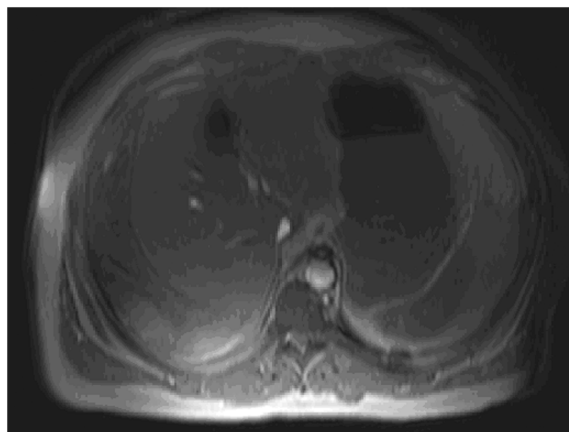


Fig. 2. Magnetic resonance imaging of abdomen showing liver haematoma at 5 days after thrombolysis.

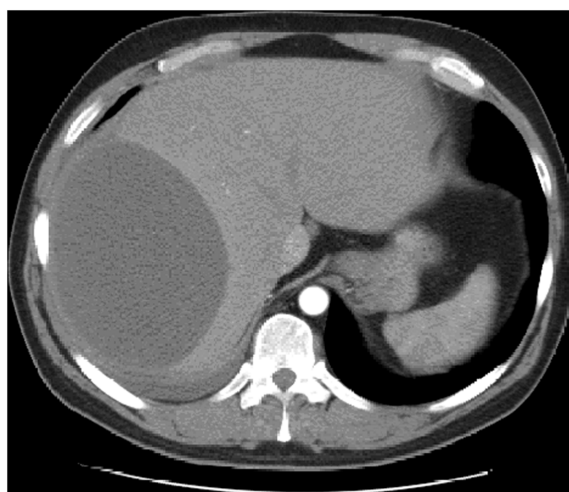


Fig. 3. Contrast-enhanced abdominal CT showing liver haematoma at 47 days after administration of thrombolysis.

Discussion

Spontaneous haemorrhagic bleeding caused by thrombolysis is extremely rare. A search of the Medline database until January 2010, augmented by searching through the citations of the articles found, revealed just 10 reports of cases^[5,7-13]. Six of the 10 previously documented cases were associated with streptokinase use rather than recombinant tissue plasminogen activator (Reteplase), as in our patient, but this is probably due to streptokinase being an older agent. Time of presentation was from within hours to 3 days after commencing thrombolysis. Symptoms typically included abdominal pain (most often right upper quadrant), vomiting, abdominal distension, and symptoms of haemorrhagic shock. Laboratory studies revealed anaemia, and the definitive diagnosis was made on ultrasound, CT scan or during exploratory laparotomy. One of the cases was diagnosed during post mortem examination^[5].

The condition has significant mortality; of the 10 cases described there were 2 fatalities^[3,5]. The management of subcapsular haematoma may be operative, radiological (transcatheter embolization), or conservative. Our case is unique in that, to our knowledge, it is the only spontaneous liver haematoma associated with thrombolysis to be successfully managed non-operatively. However, conservative management of liver haematoma has previously been successful with bleeding due to warfarin^[4,6]. All of the reviewed cases underwent operative treatment of bleeding such as electrocautery, ligation of the hepatic artery, partial liver resection, or packing. Embolization was attempted in one case but was unsuccessful and the patient had to undergo laparotomy; this patient subsequently died^[3].

Teaching points

Close monitoring of patients after thrombolysis is essential to identify those at risk of haemorrhagic complications. Liver haematoma must be considered in any patient with sudden onset abdominal pain and signs of shock in those after thrombolysis as it may be life threatening. The condition may be managed conservatively in select cases if the capsule does not rupture and the patient is clinically stable.

References

1. The Global Use of Strategies to Open Occluded Coronary Arteries (GUSTO III) Investigators. A comparison of reteplase with alteplase for acute myocardial infarction. *N Engl J Med* 1997; 337: 1118–23.
2. Brunner M, Schreiber W, Zehender M, Laggner AN. Bleeding complications during the early phase of thrombolytic therapy with tissue-type plasminogen activator. *Intens Care Med* 1996; 22: S86. doi:10.1007/BF01921260.
3. García-Jiménez A, Castro Mao M, Freire Moán D, *et al.* Hepatic bleeding and hemorrhagic shock following thrombolytic therapy in patients with acute myocardial infarction. *Chest* 1997; 111: 1787.
4. Erichsen C, Søndena K, Søreide JA, *et al.* Spontaneous liver hematomas induced by anti-coagulation therapy. A case report and review of the literature. *Hepatogastroenterology* 1993; 40: 402–6.
5. Fox SB, Carr B, Robinson A, Wilson RM. Fatal rupture of a subcapsular liver haematoma in a patient treated with anisoylated plasminogen streptokinase activated complex. *Postgrad Med J* 1991; 67: 699–700. doi:10.1136/pgmj.67.789.699-a. PMID:1924069.
6. Behranwala KA, Tisdall M, Habib NH, Canelo R. Spontaneous bilobar subcapsular hematoma of the liver while undergoing anticoagulation therapy: our experience and review of the literature. *Int Surg* 2004; 89: 212–16.
7. Willis SM, Bailey SR. Streptokinase-induced subcapsular hematoma of the liver. *Arch Intern Med* 1984; 144: 2084–5.
8. Tomescu D, Vişan A, Popescu I, Tulbure D. [Liver rupture of a subcapsular haematoma after pharmacologic revascularization (streptokinase) for acute myocardial infarction – case report]. *Chirurgia (Bucur)* 2008; 103: 577–82.
9. Krammer B, Steiner M, Burstein C, *et al.* [Spontaneous, massive liver hemorrhage as a complication of thrombolysis with ultra-high dose streptokinase in deep thrombophlebitis]. *VASA* 1994; 23: 373–6.
10. Roongsritong C, Buell JC. Spontaneous hepatic hemorrhage following treatment with tissue plasminogen activator. *Int J Cardiol* 1994; 46: 182.
11. Eklöf B, Gjöres JE, Lohi A, Norgren L, Staszkiwicz W. [Spontaneous rupture of the liver and spleen during streptokinase treatment of deep venous thrombosis]. *Lakartidningen* 1978; 75: 777–8.
12. Hinterthaler M, Kaminski M, Hirner A, Fischer HP. [Spontaneous liver rupture after thrombolytic therapy with streptokinase]. *Zentralbl Chir* 1997; 122: 49–51.
13. Ismail A, Cole JP. Subcapsular hepatic and intraperitoneal bleed after administration of tissue plasminogen activator in a patient with acute myocardial infarction. *Heart Dis* 2000; 2: 13–15.